SINAU: JURNAL ILMIAH PENDIDIKAN DAN PEMBELAJARAN
Vol. 4 No. 2, 2026, 317-326
E-ISSN 2964-5824
https://instructionaljournal.com/index.php/sinau/
https://doi.org/10.5281/zenodo.22149039

Enhancing Engagement and Skill Acquisition in MOOCs: A Flipped Project-Based Learning Approach

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ABSTRACT

Massive Open Online Courses (MOOCs) have transformed access to education by reaching a global audience, yet they frequently struggle to promote active learning and long-term student engagement. To overcome these problems, this research proposes incorporating Flipped Project-Based Learning (FPBL) into MOOC environments. FPBL blends project-based learning ideas with flipped classroom tactics, allowing students to first engage with individual course content before collaborating on long-term, planned projects. The study involved 30 respondents at Universitas Indraprasta PGRI Jakarta who participated in multiple MOOC iterations. Data were collected through surveys, assessments, and project evaluations. Quantitative and qualitative analyses were conducted to assess the impact of FPBL on student engagement, critical thinking, and project performance. Results show that FPBL significantly improves student involvement, retention, and mastery of complex content compared to traditional MOOC models. These findings emphasize the potential of FPBL to improve the engagement and educational impact of MOOCs, providing new solutions for online learning environments.

Keywords: MOOCs, Flipped Classroom, Project-Based Learning.

INTRODUCTION

English language instruction is very important to improve people's speaking abilities (Rahman, Wibawa, and Sumantri 2019), especially for the Test of English as a Foreign Language

- Institutional Testing Program (TOEFL ITP). It is crucial to use innovative and intuitive teaching methods to ensure that many people with different backgrounds and abilities may get TOEFL ITP training.

Massive Open Online Courses, or MOOCs, have become a major obstacle to global access to education (Malita, Laura Tiru, Laurentiu Gabriel Grosseck 2018). They offer free or extremely inexpensive learning opportunities to millions

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E-ISSN 2964-5824
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of students worldwide. MOOCs leverage online platforms to reach a large audience without geographic barriers, overcoming traditional obstacles like meal prices, physical locations, and employee satisfaction . In the last few years, MOOCs have been used by universities, businesses, and non-educational organizations to provide a variety of courses ranging from academic to professional (Karlsson et al. 2014).

Even while MOOCs have been successful in drawing a sizable participant base, they frequently struggle to sustain student interest and guarantee active learning over the long run. Research indicates that MOOC completion rates are incredibly low, partly because of the passive learning strategies they use, such viewing videos and doing quizzes (Karlsson et al. 2014).

Furthermore, a dearth of personalization and little opportunity for participant interaction demotivate many pupils from finishing.

This study aims to address this challenge by evaluating the integration of Flipped Project-Based Learning (FPBL) into MOOC environments. Project-based learning, which encourages student collaboration in completing long-term projects, is combined with the flipped classroom concept, which involves students studying material independently outside of the classroom (Syakdiyah, Wibawa, and Syahrial 2020). In this model, students will interact with course content in a more direct and hands-on manner through videos, readings, or visual aids. They will then work in groups to complete projects that are designed to help them apply the learnt material.

The goal of this FPBL is to increase student satisfaction by providing more complex and contextual learning experiences. Collaborating on a project will encourage students to be more active, engage with other students, and apply their knowledge in real-world situations. Accordingly, it is anticipated that FPBL would be able to increase the effectiveness of MOOCs, not only in terms of participation but also in terms of achieving better and longer-lasting learning outcomes. Through this study, we want to be able to provide more insight into how FPBL integration into MOOCs might alleviate the challenges of pass-level education and increase reading comprehension as well as intermediate reading in online courses.

Theoretical Framework

Massive Open Online Courses (MOOCs)

Considering Scalability and Massiveness A feature that sets MOOCs apart from

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typical classroom environments is its capacity to hold a large number of students. With peer evaluation, automatic grading, and a wealth of learning tools that enable dozens or even millions of users to enroll at once, they use digital platforms to deliver scalable education. The notion of massification, which describes the expanding accessibility of educational content to a worldwide audience, provides the foundation for the scalability of MOOCs (Malita, Laura Tiru, Laurentiu Gabriel Grosseck 2018).

Merrill's First Principles of Instruction and other instructional design principles are frequently used to evaluate the caliber of MOOC instruction. Problem-centered learning, prior knowledge activation, application, integration, and demonstration are some of these guiding concepts. Real-world tasks, scaffolded learning, and chances for reflection and feedback are all included in effective MOOCs to improve the quality of instruction (Margaryan, Bianco, and Littlejohn 2015).

MOOCs are a major change in the educational landscape because they use technology to provide flexible, scalable, and accessible learning environments. They provide worldwide access to knowledge, emulating the principles of self-directed learning, connectivism, and open education. However, MOOCs must overcome issues with certification, engagement, and retention if they are to realize their full potential as a revolutionary teaching tool. Flipped Project-Based Learning (FPBL), which is a more structured, interactive, and collaborative component, could improve the efficiency of MOOCs in promoting long-term learning and professional growth.

Flipped Project-Based Learning

Applying Flipped Classroom Learning By distributing educational content outside of the classroom—often online—flipped learning flips the traditional classroom model. With Flipped Project Based Learning, students work on course materials (such as texts and video lectures) at home, freeing up in-class time for group projects and practical exercises. By encouraging independent study and preparation before class activities, this method gives students the power to take charge of their education (Karlsson et al. 2014).

Project-Based Learning is emphasized With project-based learning, or PBL, students gain knowledge by working on relevant and real-world projects. PBL enables students to apply information in real-world contexts by promoting active inquiry, problem-solving, and critical thinking. FPBL integrates the flipped classroom approach with PBL's tenets to foster deep learning via teamwork and

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project participation.

Project-Based Learning (PBL) has been a steadfast supporter of the George Lucas Educational Foundation (GLEF) as a useful teaching tool (Sulaeman 2020). A general framework for PBL was provided by GLEF in their 2005 resources. This framework is commonly modified into six main phases or stages to direct the learning process. Students gain practical skills during these phases by actively exploring and working together.

The following summarizes the six steps that are frequently associated with PBL and were covered in several GLEF documents from 2005: 1) Start with the Essential Question: The learning process is framed by the question or challenge that is posed at the beginning of the endeavor. To pique students' interest, the question should be interesting, open-ended, and relevant to current events; 2) Create a design for the Project: Students and teachers work together to design the best way to approach the problem or inquiry. This entails figuring out what materials, procedures, and equipment are required to finish the job. Although planned, the plan is adaptable to allow for student-driven research; 3) Establish a Timetable: To assist students in staying on course, a timeline is devised. There are deadlines for every stage of the project, which promotes time management and clarifies expectations for students at each stage; 4) Keep an eye on the Students and the Project's Development: Teachers serve as mentors and facilitators, offering advice and criticism all during the project. They make sure that kids are still focused and contributing, and they provide assistance as needed; 5) Assess the Outcome: Assessment occurs all along the way, not only at the end when the project is evaluated. To gauge comprehension and development, formative evaluations such as check-ins, peer reviews, and reflections are employed; 6) Evaluate the Experience: Following the project's completion, educators and students consider the methods used and the results obtained. Students can better internalize their learning through this reflection, which also provides ideas for future project improvement.

To create a dynamic and captivating learning environment, Flipped Project-Based Learning (FPBL) combines the best elements of project-based learning with flipped learning. FPBL increases student engagement, encourages critical thinking, and promotes active learning by giving students the freedom to prepare independently and work together on meaningful projects in the classroom. This theoretical framework demonstrates how FPBL might help overcome the issues that arise in traditional learning environments, like MOOCs, by promoting student deeper engagement, practical application, and a sense of community.

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METHODE

The following is a structure for formative evaluation of the Flipped Project-Based Learning (FPBL) paradigm used in MOOCs. It has three steps (Materials Expert, Instructional Design Expert, and Media Expert), carried out through one-to-one, small-group, and field trial exercises. The purpose of this formative evaluation is to enhance and clarify the course design based on FPBL using feedback from instructors and students.

The table below shows the Expert Judgment scoring system with five categories: Very Good, Good, Enough, Poor, and Very Poor. Each assessment criterion is designed to evaluate various design, content, media, or instruction aspects within a system or course based on expert evaluations.

Table 1. Assessment Criteria

Assessment Criteria	Very Good (5)	Good (4)	Enough (3)	Poor (2)	Very Poor (1)
Materials Expert	Content is very relevant, aligns fully with objectives, and covers all necessary aspects in depth.	Content is relevant and aligns well with the objectives, but could benefit from slight improvement.	Content is moderatel y relevant but lacks depth or focus on certain key areas.	Content is somewhat relevant but misses many important aspects.	Content is irrelevant and does not align with the course or project objectives.
Instructional Design Expert	Instructional design is excellent, fully supporting learning outcomes and engagement.	Instructiona l design is good and aligns well with learning objectives but could be enhanced.	Instruction al design is adequate, but needs improvem ents to better support the learning process.	Instructiona l design is weak and does not effectively support learning outcomes.	Instructional design is very poor, failing to facilitate learning or engagement.
Media Expert	Media and technology are highly engaging, creative, and fully support the learning process.	Media and technology are used effectively, though some improveme nts can be made in interactivity or relevance.	Media and technolog y are adequate, but lack engageme nt or creativity.	Media and technology are poorly used, offering little support to the learning process.	Media and technology are very ineffective and do not contribute to learning at all.

The average value of all the variables is determined by applying statistics to the gathered questionnaire responses. This average value serves as the

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foundation for the assessment level of the learning model, which has been created in accordance with evaluation criteria and is shown in table 2 below:

Average Score	Classification
4,3 – 5.0	Very Good
3,5 – 4,2	Good
2,7 – 3,4	Enough
1,9 – 2,6	Poor
0 – 1,8	Very Poor

The learning model created is classified as good overall, according to the evaluation results from experts on the Flipped Project Based MOOCs model. This is shown in table 3 below

No	Expert	Average Score
1	Material	4,09
2	Instructional Design	4,61
3	Media	4.43
Overall average score		4,38
Conclusion: Good		

Conducting an evaluation with students comes next in the evaluation process, which begins with improving the first draft learning model to Draft 1 based on expert advice. Starting with a one-to-one assessment, three students who have completed the TOEFL ITP course before are chosen. The researcher will be able to get detailed feedback on the learning model's usability, content clarity, and general efficacy from these students as they engage with it one-to-one. The objective is to determine which areas require additional improvement prior to moving on to more extensive testing stages. Through this procedure, the model's alignment with the needs of students and its successful support of learning outcomes are ensured.

Table 4. Research Instrument Statement

No	Statement
1	The level of vocabulary used in TOEFL ITP materials
2	Use of sentence complexity in TOEFL ITP materials
3	Use of message complexity in TOEFL ITP materials
4	Clarity of the message conveyed in the introduction/preliminary stage
5	Clarity of messages in the presentation of learning diligently and carefully (elaboration).
6	Clarity of the message conveyed in the conclusion
7	Clarity of transition between each stage in the message conveyed
8	Clarity of the relationship between the context of TOEFL ITP material with examples and non-examples for students
9	Clarity of the relationship between the context of TOEFL ITP material and analogies for students
10	Clarity of the relationship between the context of TOEFL ITP material and illustrations for students
11	Clarity of the relationship between the context of the TOEFL ITP material

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	and demonstrations for students
12	Clarity of the relationship between the context of the TOEFL ITP material and the reviews presented to students
13	Clarity of the relationship between the context of the TOEFL ITP material and the summary presented to students
14	Clarity of the sequence of each TOEFL ITP material for students
15	Clarity of the size of the TOEFL ITP material segments presented to students
16	Clarity of transition between TOEFL ITP learning segments for students
17	Adequate time used in delivering TOEFL ITP material to students
18	Clarity of presentation variations of each TOEFL ITP material for students
19	Benefits of TOEFL ITP material information
20	Benefits of TOEFL ITP skills for students
21	Ease for students in learning TOEFL ITP material
22	Student satisfaction with the TOEFL ITP material studied
23	Clarity between post-test items and learning materials and learning objectives
24	Ease of students in understanding TOEFL ITP post-test items
25	Performance achieved by students in the TOEFL ITP post-test
26	TOEFL ITP Learning with the MOOCs Flipped Project Based Learning Model MOOCs Flipped Project Based Learning according to the level of student maturity
27	TOEFL ITP learning with the MOOCs Flipped Project Based Learning Model is used to improve student learning independence.
28	Students have high motivation to complete TOEFL ITP learning with the MOOCs Flipped Project Based Learning Model
29	Students can complete TOEFL ITP learning with the MOOCs Flipped Project Based Learning Model according to the specified time.
30	The feasibility of time required for TOEFL ITP learning with the MOOCs Flipped Project Based Learning Model
31	Feasibility of learning equipment needed for TOEFL ITP learning with the MOOCs Flipped Project Based Learning Model
32	Feasibility of learning environment that supports TOEFL ITP learning with MOOCs Flipped Project Based Learning Model
33	Relevance of teaching materials to TIU and ICT
34	Relevance of tests to teaching materials, TIU and ICT
35	The syntax of the TOEFL ITP learning model with the MOOCs Flipped Project Based Learning Model is relevant to learning objectives
36	The syntax of the TOEFL ITP learning model with the MOOCs Flipped Project Based Learning Model is relevant to the characteristics of the course
37	The reaction principle supports the achievement of learning objectives
38	Suitability of the support system (modules and applications) with the TOEFL ITP learning model with the MOOCs Flipped Project Based Learning Model
39	The TOEFL ITP learning model with the MOOCs Flipped Project Based Learning Model has a learning impact.
40	The TOEFL ITP learning model with the MOOCs Flipped Project Based Learning model

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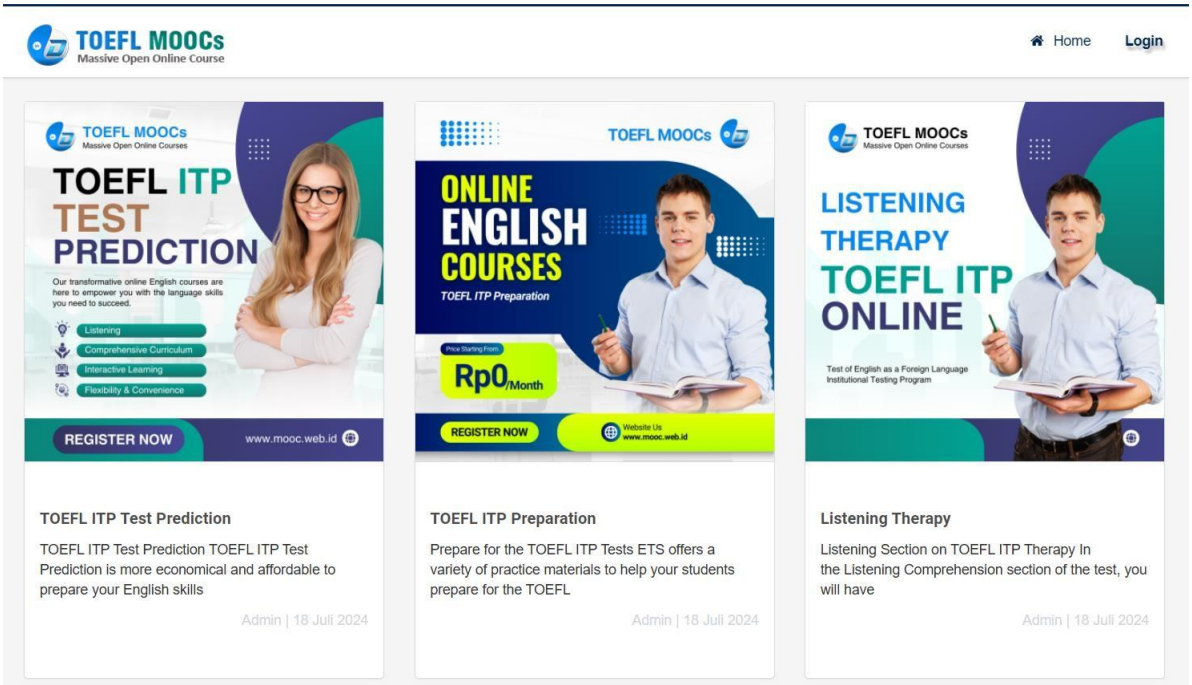
	has an accompanying impact
41	The TOEFL ITP learning model with the MOOCs Flipped Project Based Learning model supports learning interactions.
42	The TOEFL ITP learning model with the MOOCs Flipped Project Based Learning model can increase students' learning motivation

DISCUSSION AND/OR CONCLUSION

User Interface of TOEFL MOOCs

The TOEFL MOOCs application can be accessed via an internet browser at the URL mooc.web.id. The homepage of the application serves as the initial landing page for users, providing access to course offerings, user registration, and other relevant features for TOEFL preparation through the MOOC platform.



Picture 1 TOEFL MOOCs Homepage

On the homepage of the TOEFL MOOCs application, there is a "Login" button that allows users to access the platform. By clicking on this button, users can log in to their accounts to access the available TOEFL courses, track their progress, and utilize other features provided by the platform for TOEFL preparation

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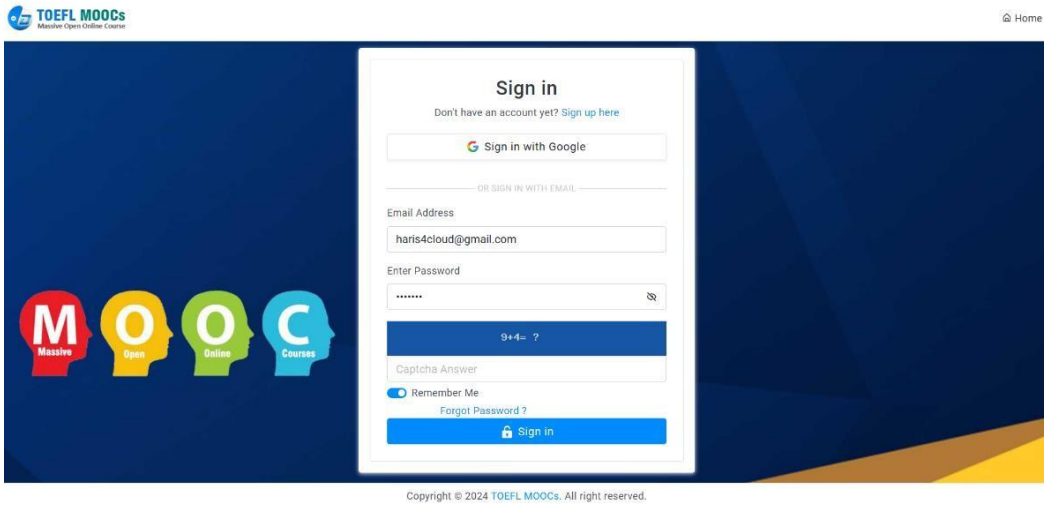
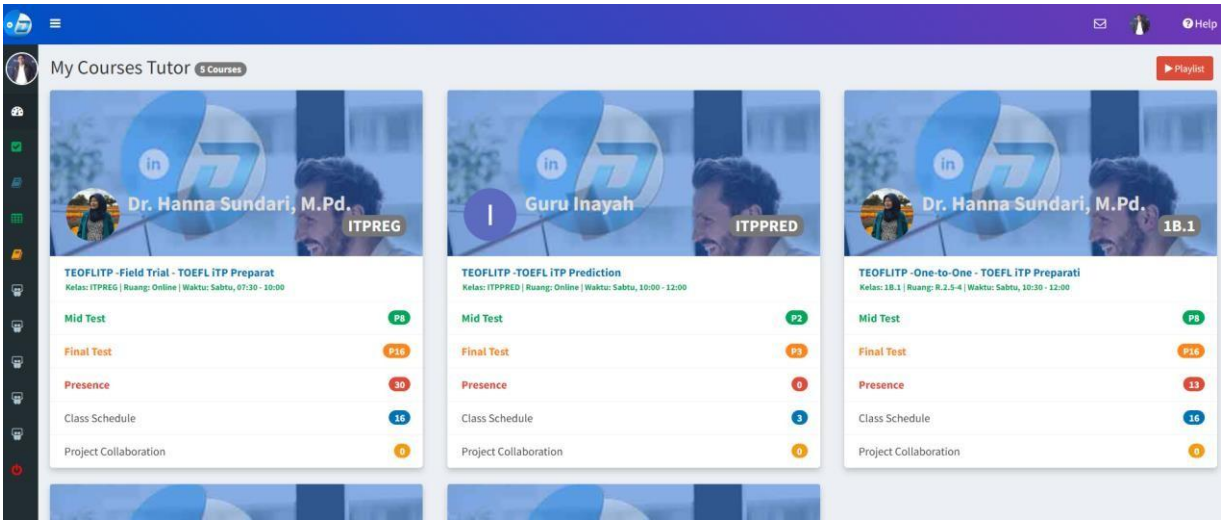


Picture 2. Login Form

It seems like you're referring to a login form displayed as "Picture 2." In the TOEFL MOOCs application, the login form typically includes fields where users can enter their username or email and password to access their accounts. There is often a "Login" button to submit the credentials, and options for password recovery or registration for new users may also be present.



Picture 3. Dashboard Page TOEFL MOOCs

After the user logs in, the TOEFL MOOCs application will display the dashboard page. This dashboard serves as the main interface where users can access various features and resources. It typically includes options for navigating available courses, tracking learning progress, viewing course materials, accessing quizzes or practice tests, and managing user profile settings. The dashboard provides a centralized hub for all user activities related to TOEFL preparation on the platform.

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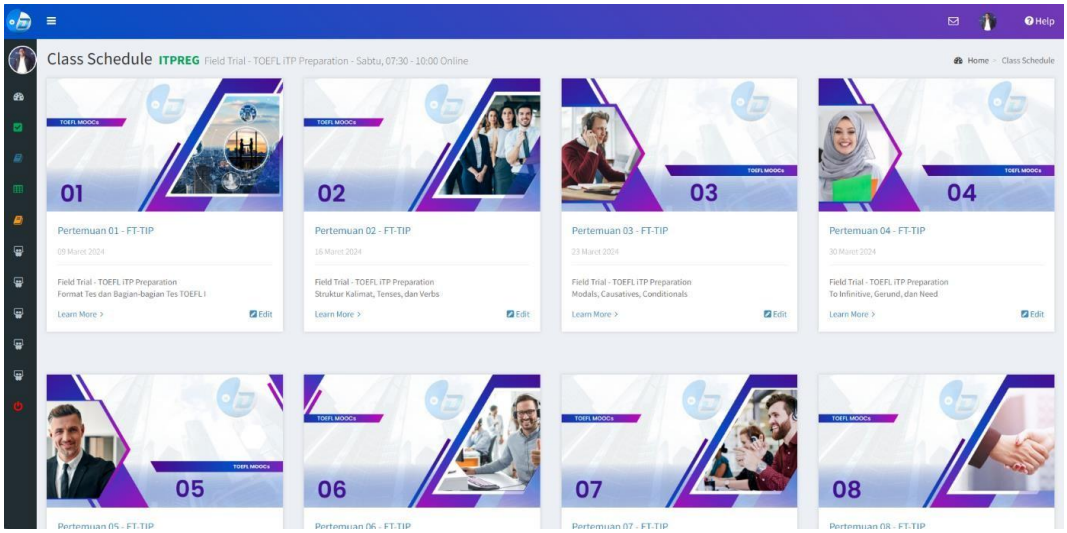
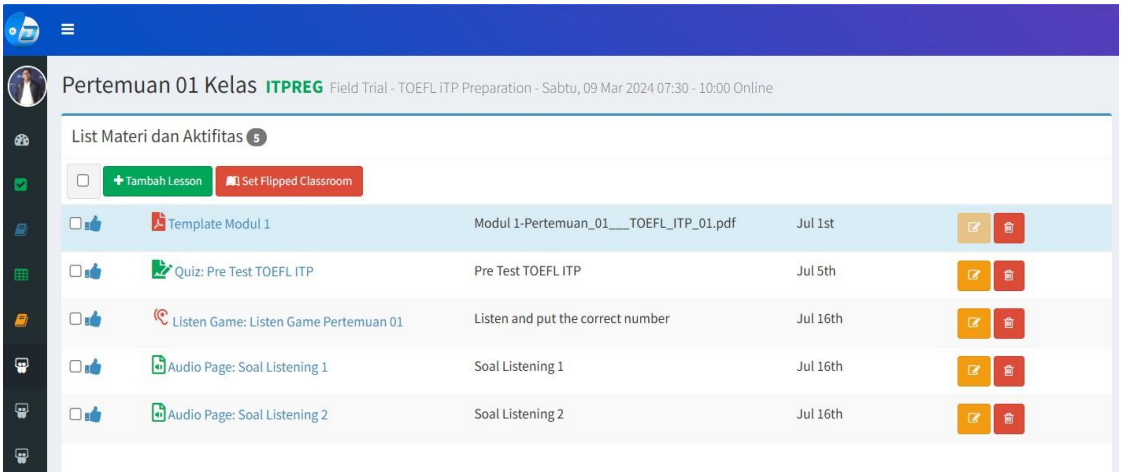


Picture 4. Class Schedule



Picture 5. Course Materials

"Picture 5" seems to refer to the Course Materials section in the TOEFL MOOCs application. In this section, users can access various learning resources specifically designed for TOEFL preparation. The Course Materials section is intended to provide comprehensive support for students to enhance their language skills and prepare effectively for the TOEFL exam.

Conclusion

This study examined how to incorporate Flipped Project-Based Learning (FPBL) into Massive Open Online Courses (MOOCs) in order to address the shared difficulties of encouraging active learning and sustaining sustained student involvement. Students can interact with the material alone before working together on extensive, long-term projects through the use of FPBL, which combines project-based learning with flipped classroom techniques.

Surveys, tests, and project evaluations provide evidence that, in comparison

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E-ISSN 2964-5824
https://instructionaljournal.com/index.php/sinau/
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to conventional MOOC models, FPBL greatly improves student engagement, retention, and mastery of difficult content. This conclusion is based on data from 30 respondents who took part in multiple MOOC literations. These results show that FPBL has the potential to increase MOOC engagement and educational impact, offering a promising approach to creating online learning environments that are more successful.

Future Work

Even though the current study offers compelling proof of FPBL's efficacy in MOOCs, future research may examine bigger sample numbers to corroborate similar results in other settings. Further insights on FPBL's flexibility could be gained by examining the long-term effects of the method on knowledge retention and skill development across a range of topic areas. Additional investigation may concentrate on streamlining the technology infrastructure needed to provide FPBL to a large number of students and improving how it is implemented to accommodate students with different degrees of digital literacy. It will also be easier to create a more comprehensive framework for improving active learning and engagement in MOOCs if this strategy is extended to other kinds of online learning environments.

Conflict of Interest

I, Haris, hereby declare that I have no competing interests with respect to the study reported in this publication. I certify that I have no financial, personal, or professional affiliations that could be used to unfairly influence or bias our work, nor do any of my co-authors. The standards of scholarly conduct are upheld by the utmost transparency and integrity when generating this statement.

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